

IN THE CLAIMS:

Claim 1 (Currently amended) In a combination of a swage collar apparatus, a fastener and a composite assembly of workpieces for sealing a connection of the fastener through the composite assembly of workpieces together and for preventing leakage through the connection, the fastener including a shaft having an externally threaded or grooved section, the improvement in the swage collar apparatus comprising:

a one-piece, hollow, generally cylindrical swage collar swaged over the shaft of the fastener, said one-piece, hollow, generally cylindrical swage collar having a main body portion with a main central bore, and a base portion with an internal shoulder formed in the main central bore so as to form a seal receiving guide, the internal shoulder having a diameter that is larger than the diameter of the main central bore, and the internal shoulder having a surface defining a continuous annular well, the base portion having a flat even surface contacting said assembly of workpieces; and

an internal sealing insert having an external diameter no larger than the diameter of the internal shoulder of the base portion of the swage collar, so as to be tightly sealed entirely in the well of the swage collar between the internal shoulder of the swage collar and the shaft of the fastener in engagement with the fastener.

Claim 2 (Cancelled)

Claim 3 (Previously presented) The swage collar apparatus of Claim 2, wherein the base portion is flared outward, having an external diameter larger than the main

central bore, and wherein said internal sealing insert is flush with said base portion when installed on said composite assembly of workpieces.

Claim 4 (Original) The swage collar apparatus of Claim 1, wherein the swage collar is made of a metal.

Claim 5 (Original) The swage collar apparatus of Claim 4, wherein the swage collar is made of aluminum.

Claim 6 (Original) The swage collar apparatus of Claim 4, wherein the swage collar is made of titanium.

Claim 7 (Original) The swage collar apparatus of Claim 1, wherein the swage collar is made of a deformable material.

Claim 8 (Original) The swage collar apparatus of Claim 1, wherein the internal sealing insert is made of tetrafluoroethylene.

Claim 9 (Original) The swage collar apparatus of Claim 1, wherein the shaft includes an unthreaded section, and the internal sealing insert interfaces with the unthreaded section of shaft of the pin.

Claim 10 (Original) The swage collar apparatus of Claim 1, wherein the shaft includes a threaded section and an unthreaded section, and the internal sealing insert interfaces with the threaded section and the unthreaded section of the shaft of the pin.

Claim 11 (Original) The swage collar apparatus of Claim 2, wherein the internal sealing insert has a surface defining an annular rounded exterior flange, and the internal shoulder of the main central bore has a surface defining a corresponding rounded channel or groove into which the annular rounded exterior flange interfits, to thereby lock the

internal sealing insert into place within the internal shoulder portion of the main central bore.

Claim 12 (Original) The swage collar apparatus of Claim 11, wherein the internal shoulder of the main central bore includes an intermediate stepped portion having an interior diameter that is less than the interior diameter of the internal shoulder and greater than the diameter of the main central bore.

Claim 13 (Currently amended) In a combination of a sealing fastener apparatus and a composite assembly of workpieces joined together and preventing leakage through a connection formed by the fastener through the composite assembly of workpieces, the improvement comprising:

a fastener having a shaft;

a hollow, generally cylindrical, one-piece swage collar, the swage collar having a main body portion with a main central bore adapted to be swaged over at least a portion of the fastener, and a base portion with an internal shoulder formed in the main central bore so as to form a seal receiving guide, the internal shoulder having a diameter that is larger than the diameter of the main central bore, the internal shoulder having a surface defining a continuous annular well, and the base portion having a flat even surface contacting said assembly of workpieces; and

an internal sealing insert having an external diameter no larger than the diameter of the internal shoulder of the base portion of the swage collar, so as to be tightly sealed entirely in the well of the swage collar between the internal shoulder of the swage collar and the shaft of the fastener in engagement with the fastener.

Claim 14 (Original) The sealing fastener apparatus of Claim 13, wherein the fastener comprises a pin having a head and a shaft, the shaft having an externally threaded section and an unthreaded section.

Claim 15 (Cancelled).

Claim 16 (Previously presented) The sealing fastener apparatus of Claim 13, wherein the base portion is flared outward, having an external diameter larger than the main central bore, and wherein said internal sealing insert is flush with said base portion when installed on said composite assembly of workpieces.

Claim 17 (Original) The swage collar apparatus of Claim 13, wherein the swage collar is made of a metal.

Claim 18 (Original) The swage collar apparatus of Claim 17, wherein the swage collar is made of aluminum.

Claim 19 (Original) The swage collar apparatus of Claim 17, wherein the swage collar is made of titanium.

Claim 20 (Original) The swage collar apparatus of Claim 13, wherein the swage collar is made of a deformable material.

Claim 21 (Original) The swage collar apparatus of Claim 13, wherein the internal sealing insert is made of tetrafluoroethylene.

Claim 22 (Original) The swage collar apparatus of Claim 14, wherein the internal sealing insert interfaces with the unthreaded section of shaft of the pin.

Claim 23 (Original) The swage collar apparatus of Claim 14, wherein the internal sealing insert interfaces with the threaded section and the unthreaded section of the shaft of the pin.

Claim 24 (Original) The swage collar apparatus of Claim 15, wherein the internal sealing insert has a surface defining an annular rounded exterior flange, and the internal shoulder of the main central bore has a surface defining a corresponding rounded channel or groove into which the annular rounded exterior flange interfits, in order to lock the internal sealing insert into place within the internal shoulder portion of the main central bore.

Claim 25 (Original) The swage collar apparatus of Claim 24, wherein the internal shoulder of the main central bore includes an intermediate stepped portion having an interior diameter that is less than the interior diameter of the internal shoulder and greater than the diameter of the main central bore.

Claim 26 (Cancelled)

Claim 27 (Currently amended) In combination, a swage fastening system for an assembly of workpieces, comprising:

a pin, the pin having an enlarged head, a smooth neck, and a threaded body;

a generally cylindrical one-piece collar swaged over the threaded body of the pin, the collar having a main central bore, a base portion with an internal shoulder formed in the main central bore so as to form a seal receiving guide, the internal shoulder having a diameter that is larger than the diameter of the threaded body, the internal shoulder

having a surface defining a continuous annular well, and the base portion having a flat even surface adapted to contact said assembly of workpieces;

a sealing ring having an external diameter no larger than the diameter of the internal shoulder of the base portion of the swage collar, so as to be disposed entirely within the well of the internal shoulder and receiving the pin; and

a swage tool which mechanically forces the collar over the pin affixing a workpiece between the enlarged head and the collar with the sealing ring flush with the base portion when installed on said workpiece, tightly sealing the sealing ring entirely within the well of the internal shoulder of the collar between the internal shoulder of the collar and the shaft of the fastener in engagement with the pin and deforming and forming a fluid impermeable seal.

Claim 28 (Original) The swage fastening system of Claim 27, wherein the collar is made of a metal.

Claim 29 (Original) The swage fastening system of Claim 28, wherein the swage collar is made of aluminum.

Claim 30 (Original) The swage fastening system of Claim 28, wherein the swage collar is made of titanium.

Claim 31 (Original) The swage fastening system of Claim 27, wherein the swage collar is made of a deformable material.

Claim 32 (Original) The swage fastening system of Claim 27, wherein the sealing ring is made of tetrafluoroethylene.

Claim 33 (Original) The swage fastening system of Claim 27, wherein the pin includes an unthreaded section, and the sealing ring interfaces with the unthreaded section of the pin.

Claim 34 (Original) The swage fastening system of Claim 27, wherein the pin includes an unthreaded section, and the sealing ring interfaces with the threaded body and the unthreaded section of the pin.

Claim 35 (Original) The swage fastening system of Claim 27, wherein the sealing ring is formed of tetrafluoroethylene.